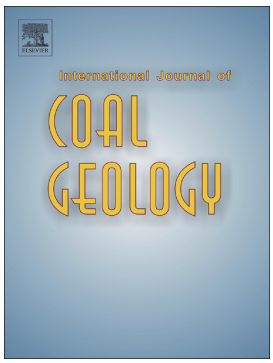

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The organic matter composition of the Devonian/Carboniferous deposits (South Flank of Arbuckle Anticline, Oklahoma, USA)

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Key words: Woodford Shale, Sycamore Limestone, AOM, palynology, palynofacies, palynostratigraphy, Upper Devonian, Tournaisian

Highlights

- Palynolofacies analysis of the Woodford Shale.
- Permanent oxygen-deficit and high productivity conditions during the Famennian.
- Stratigraphic range of the Woodford (Frasnian-Tournaisian).

Abstract

The palynological investigation was carried out on the Woodford Shale and Sycamore Limestone samples from Interstate 35 roadcut section (I-35) on the south flank of the Arbuckle Anticline (Oklahoma, USA). All samples were collected from the 54 meter long section. According to palynostratigraphy, the section was tentatively divided into three stages: Frasnian, Famennian and Tournaisian but due to poor miospores representation it was not possible to establish any single miospore zone. All samples were strongly dominated by the amorphous organic matter and by marine palynomorphs, mostly prasinophytes. The analysis of the relative frequency, fluctuations in acritarchs diversity, and morphotype variability generally suggest deposition in an open-marine, deep-water basin. Based on palynofacies analysis, the section was divided into three palynofacies: lowest (fully marine, I), middle (fully marine but closer to the shoreline, II), and the topmost palynofacies (III) which was also marine, but with a weak regressive signal.

1. Introduction

The palynological investigation has been carried out on the Woodford Shale I-35 section (Upper Devonian, Lower Carboniferous), in the Arbuckle Mountains (Oklahoma, USA; Fig. 1). Arbuckle Mountains are located in south-central Oklahoma. The Woodford Shale, has been extensively studied for hydrocarbon source rock and reservoir rock characteristics, and is one of the most significant unconventional hydrocarbon source in North America (Cardott, 2012; Miceli Romero and Philip, 2012; Turner et al., 2016). It also contains

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